

WHAT IS CLAIMED IS:

- Sub A11 5
1. An optical head device, comprising:
a plurality of semiconductor lasers; and
optical elements disposed on an optical path between the plurality
of semiconductor lasers and an optical information recording medium,
wherein the plurality of semiconductor lasers are disposed so that
beam spots, formed on the optical information recording medium, of light
beams emitted from the plurality of semiconductor lasers are aligned
substantially parallel to a pit-row direction or a guide groove direction in the
optical information recording medium.
 2. The optical head device according to claim 1, further comprising a
photodetector where returning light from the optical information recording
medium enters.
 3. The semiconductor laser device according to claim 1, wherein the
plurality of semiconductor lasers have different emission wavelengths from
one another.
 4. The optical head device according to claim 3, wherein two
semiconductor lasers are provided and have different emission wavelengths,
each of which is selected from a group consisting of ranges of: 630 nm to
690 nm, 780 nm to 820 nm, and 200 nm to 450 nm.
 5. The optical head device according to claim 1, wherein beam emission
points of the plurality of semiconductor lasers are aligned on a substantially
straight line and are spaced at 150 μ m or less.
 6. The optical head device according to claim 1, wherein one of the
optical elements is a diffraction grating.
 7. The optical head device according to claim 6, wherein the diffraction
grating is divided into $2n$ (where n indicates a natural number) diffraction
regions with different grating periods from one another.
 8. The optical head device according to claim 7, wherein dividing lines
that divide the diffraction regions are positioned substantially parallel to or
substantially perpendicular to the pit-row direction or the guide groove
direction in the optical information recording medium.
 9. The optical head device according to claim 7, wherein one of the
dividing lines that divide the diffraction regions divides returning light from
the optical information recording medium into two substantially equal parts.
 10. The optical head device according to claim 6, wherein the diffraction

Sub H
Cont 5

grating is divided into $2n$ (where n indicates a natural number) diffraction regions with different grating pitch directions from one another.

11. The optical head device according to claim 10, wherein the dividing lines that divide the diffraction regions are positioned substantially parallel to or substantially perpendicular to the pit-row direction or the guide groove direction in the optical information recording medium.

12. The optical head device according to claim 6, wherein the diffraction grating is sawtooth-shaped.

10 13. The optical head device according to claim 6, wherein the diffraction grating has grooves whose depths vary in a step-wise manner in a constant period.

14. The optical head device according to claim 1, wherein all of the plurality of semiconductor lasers are disposed on a heat sink made of a metal or a semiconductor material.

15 15. The optical head device according to claim 1, further comprising a plurality of photodetectors where returning light from the optical information recording medium enters, wherein the optical elements and the plurality of photodetectors are disposed so that part of returning light from the optical information recording medium, which originates in each of the
20 light beams emitted from the plurality of semiconductor lasers, enters one of the plurality of photodetectors at a time.

16. The optical head device according to claim 15, wherein each of the plurality of photodetectors includes a light-receiving region divided into two parts in a direction that is substantially parallel to or substantially
25 perpendicular to the pit-row direction or the guide groove direction in the optical information recording medium, part of returning light from the optical information recording medium being detected therein irrespective of which of the plurality of semiconductor lasers emits light beams.

17. The optical head device according to claim 16, wherein a linear
30 diffraction grating is included as one of the optical elements, and returning light from the optical information recording medium that originates in \pm 1st-order diffracted light formed by the diffraction grating is detected in the light-receiving region.

18. The optical head device according to claim 1, further comprising a
35 rim-intensity correction means.

19. The optical head device according to claim 3, further comprising a plurality of photodetectors where returning light from the optical

Sub H1
Arch. 5
information recording medium enters, wherein the plurality of semiconductor lasers and at least part of the plurality of photodetectors are integrated on one substrate.

20. The optical head device according to claim 2, wherein an objective lens is provided as one of the optical elements and is fixed to a package, and the plurality of semiconductor lasers, the optical elements and the photodetector are disposed in the package.

21. The optical head device according to claim 20, further comprising a supporter, wherein the package is connected to the supporter movably with respect thereto.

22. An optical recording and reproducing apparatus comprising an optical head device, the optical head device comprising;

a plurality of semiconductor lasers with different emission wavelengths from one another; and

optical elements disposed on an optical path between the plurality of semiconductor lasers and an optical information recording medium,

wherein the plurality of semiconductor lasers are disposed so that beam spots, formed on the optical information recording medium, of light beams emitted from the plurality of semiconductor lasers are aligned substantially parallel to a pit-row direction or a guide groove direction in the optical information recording medium.